1. (Amended Four Times) A method of improving the expression in a dicot plant of a Bacillus thuringiensis delta-endotoxin protein natively [between about 130 and 140] in excess of 72 kD in size and toxic upon ingestion to Manduca sexta, the method comprising the steps of:

(a) analyzing the pattern of nucleotide codon usage in native plant genes having relatively high levels of expression in plants to select from among the codons coding for the same amino acid the codons for each amino acid which are utilized preferentially by the native plant genes;

(b) synthesizing a chimeric nucleotide coding sequence coding for the expression of the amino acid sequence of the [about 130 to 140 kD protein] delta-endotoxin from Bacillus thuringiensis with the chimeric coding sequence comprising at least a first 5' 25 codons differing from those in the coding sequence in Bacillus thuringiensis and selected from among the codons determined from Figure 1 to be preferentially utilized by the native plant genes;

(c) joining the chimeric nucleotide coding sequence with flanking regulatory sequences effective to express the chimeric coding sequence in plants; and

(d) transforming the chimeric coding sequences together with the regulatory sequences into the germ line of the dicot plant so that the delta-endotoxin protein is produced in cells of the transformed plant so that the plant is toxic upon ingestion to Manduca sexta.

15. (Amended Three Times) A transgenic dicot plant comprising in its genome a constructed gene including a protein coding region coding for [the] an amino-terminal portion of [the about 130 to 140 kD] a delta-endotoxin [gene of] protein from Bacillus thuringiensis, the delta-endotoxin protein being natively in excess of 72 kD in size and natively toxic upon ingestion by Manduca sexta, the constructed gene including appropriate regulatory sequences to express the coding region so that cells of the plant produce the delta-endotoxin protein so as to be toxic upon ingestion by Manduca sexta, the coding sequence of the gene including a 5' region of at least 150 nucleotides in length constructed as an oligonucleotide from nucleotide codons selected from those codons determined from Figure 1 to be efficiently expressed in the cells of plants, the sequence of [and pattern of]

codons being different from those in the coding region of the native gene in Bacillus thuringiensis.

17. (Amended Four Times) A transgenic dicot plant comprising in its genome a constructed gene including a protein coding region coding for [the] an amino terminal toxin encoding portion of [the about 130 to 140 kD] a delta endotoxin protein from Bacillus thuringiensis, the delta-endotoxin protein being natively in excess of 72 kD in size and natively toxic upon ingestion by Manduca sexta, the constructed gene including appropriate regulatory sequences effective in plant cells to express a coding region so that cells of the plant produce the delta endotoxin toxin protein in sufficient amount to be toxic upon ingestion to Manduca sexta, the coding region of the gene including a synthesized 5' region of between 25 and 132 codons in length constructed from nucleotide sequences selected from those codons determined from Figure 1 to be efficiently expressed in the cells of plants and a 3' region comprising the native sequence from Bacillus thuringiensis.

18. (Amended Four Times) A transgenic dicot plant comprising in its genome a constructed gene including a protein coding region coding for the about 72kD amino terminal toxin portion of [the about 130 to 140 kD] a delta endotoxin gene from Bacillus thuringiensis, the delta-endotoxin protein being natively in excess of 72 kD in size and natively toxic upon ingestion by Manduca sexta, the constructed gene including appropriate regulatory sequences effective in plant cells to express a coding region, the coding region having a 5' portion identical to the sequence of BT4 listed as the top sequence in Figure 2 and a 3' portion identical to the native sequence from Bacillus thuringiensis HD-1 Dipel ssp. kurstaki.

19. (Amended) A DNA molecule comprising a gene including a protein coding sequence derived from the [amino-terminal portion] 5' end of the gene from Bacillus thuringiensis encoding [the about 130 to 140 kD] a delta-endotoxin natively in excess of 72 kD in size and natively toxic upon ingestion by Manduca sexta, the gene including appropriate regulatory sequences to express the protein coding sequence so that cells of a plant hosting the gene produce delta-endotoxin protein so as to be toxic upon

ingestion by Manduca sexta, the protein coding sequence of the gene including a 5' region of at least 150 nucleotides in length constructed from nucleotide codons selected from those codons determined from Figure 1 to be efficiently expressed in the cells of plants, the sequence of [and pattern of] codons being different from those in the protein coding sequence of the gene in Bacillus thuringiensis.

Remarks

This Amendment is made in to the Office Action dated June 23, 1993 in the file of the above identified patent application. In that Office Action, all the claims of this application were rejected under §112, and claims 15-19 were also rejected over the prior art. Based on the changes to the claims made above and the comments made here, the applicants respectfully request the Examiner to again reconsider the merits of this patent application.

Rejection under §112, second paragraph

The Examiner, in the Office Action, rejects claims 15-16 and 18-19 in the present patent application for language indefiniteness. The applicants have attempted to correct the informalities above.

The Examiner's observation about the choice of words in the phrase "sequence of and pattern of" was well taken. The words "and pattern of" have been deleted, to make it clear that what is simply intended to be described is that the sequence of codons is different.

The Examiner's observation about the reference to a "130 to 140 kD delta-endotoxin gene" is also well taken. The language has been revised in an attempt to be more precise in descriptions of the DNA as distinguished from the proteins.

The Examiner's observation that genes don't have amino termini is equally correct. The language has been revised to refer to the amino termini of proteins, or portions thereof, and to the 5' end of genes.

It is hoped that these corrections have been properly made and will cure the observed defects.